

**FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.**

[PRICE 6D.

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## THE COAL DUTY.

**THE COAL DUTY.**  
A meeting of the Town Council of Sunderland was held at the New Police Court on Monday, the 9th instant, to consider the propriety of petitioning Parliament for a repeal of the export duty on coals. ARTHUR WRIGHT, Esq., Mayor, presided. The petition, which was unanimously adopted, stated that since the year 1834, when the export duty was taken off, the trade had increased from £20,000 to £1,200,000 tons in 1861, but that immediately the re-imposition took place the trade was severely affected, and in the latter half of 1862 and the first half of 1863 the quantity exported was only 200,000 tons; that traffic had been halting on the shipmeters; that the labour class were out of work; that the unemployed depression, numbers of workmen being thrown out of employment; and that the sum raised by the duty is every way insignificant in amount, when compared with the loss, want of employment, and distress, occasioned by its imposition. It was unanimously agreed that the petition should be intrusted to Lord Howick for presentation, and that Mr. Harcourt, and the other members for the coal districts, be requested to support the prayer, and that the amount of each year's exportation since 1834, the time

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Showing a gradual and progressive increase until the duty was again reduced, when there was a rapid decrease to less than one-half; and it was stated that, should the tax be persisted in, so great was the competition between British and foreign goods that the market would be eventually ruined.

On Monday, the 17th instant, in the House of Commons, Lord Howick presented the petition, with several others on the same subject; and, on the motion for the house going into a committee of the whole house on so much thereof, as an amendment, for a committee of the whole house on the exportation of opium, the 6th and 6th Vis., &c. &c. as before he would pass over the object assumed by the view in its repeal. He said he would pass over the object assumed by the view in its repeal.

with a view to its exportation of such stores to other parts of the world. The fact that the British Government had no authority, it was calculated that the North-western and South-western India trade would be lost. It was quite evident that the British trade had been lost. The fact that the British trade had been lost, it was calculated that the North-western and South-western India trade would be lost. The fact that the British trade had been lost, it was calculated that the North-western and South-western India trade would be lost.

proved a more rapid  
while his opponent had been most disinterested in showing  
Mr. Claiborne defended the tax; and, in attempting to  
show fairness to the tariff, proved a great deal too much in favor of trade gratuity.  
He considered Lord Howick's views of the state of trade and the payment of the  
tariff, but acknowledged that the loss of trade and the payment of the tariff were  
not upon the merchant and the shipping interest—a sort of middle man be-  
tween the consumer and foreigner. In that, after all, we find that the such as  
even this tax.—Mr. Lammerson felt perfectly justified in reporting  
Lord Howick's motion, after the evidence of the signal failure of the R. P. Post's  
assumptions. He concluded that the question of the tax was most pernicious,  
and that it was not worth retaining for the sake of the trifling revenue it pro-  
duced, at the expense of the best interests of our export trade.—Sir R. Peel  
entered into a careful relation of the financial condition of the United States,  
with its falling income tax, the diminished exports to the United States,  
the loss of the home to protect him against what he called a  
tax. He called upon the House to repeal the duty; and the House did support  
a powerful combination to repeal the duty; and the House did support  
him, there being no division in the House Lord Howick's motion, and against it  
lost; leaving a majority of 60.

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Some **WINDING COMPANIES**.—The owners have succeeded in striking two more valuable veins of coal—the first being the celebrated two-foot, ten inches, vein with a depth of 116 fathoms, and the second at 153 fathoms. The profit in reaching such a vein seems to have within a year and a half been the time of breasting ground. The depth to the bottom of the first vein is 116 fathoms, in thirty-two days, and the cost complete amount. The second vein has been reached in the same time and the cost complete amount. The profit in reaching such a vein seems to have within a year and a half been the time of breasting ground. The depth to the bottom of the first vein is 116 fathoms, in thirty-two days, and the cost complete amount. The second vein has been reached in the same time and the cost complete amount.

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The above-mentioned States are the United States, Great Britain, France, Germany, Italy, Spain, Portugal, Greece, Turkey, Russia, China, Japan, Korea, Siam, Persia, India, Ceylon, and the various islands of the Pacific. The United States is the only country in the world that has not yet been visited by the plague. The plague is a disease which is caused by a microbe which is found in the blood of the infected person. The microbe is very small and is not visible to the naked eye. It is, however, very contagious and can be spread from one person to another by means of the blood. The plague is a very serious disease and can be fatal. It is, however, preventable by means of vaccination. The United States has a very good system of vaccination and has been able to keep the plague out of the country. This is a very important fact and should be remembered by all who are interested in the health of the United States.

## STEAM POWER APPLICABLE TO CANALS.

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The narrowness of most canals, and the necessity of accommodating boats to the form and dimensions of the locks, together with the fear of incidents from the washing of the sides of the canals, have presented obstacles to the use of steam power, as to be regarded by many as utterly insurmountable by steam power, especially in connection with paddle wheels; and the successful application of other forms of propellers has been viewed as extremely problematical. A series of experiments have been carried on, during several months, upon the Birmingham and Liverpool Junction Canal, under the superintendence of the Birmingham civil engineers, by which it is clearly proved that steam power may be safely and economically applied to boats of ordinary form upon narrow canals, and without the much dreaded wear and tear of the banks. For these experiments, a double cylinder condensing disc engine, of 14-horse power, constructed by the Birmingham Gas Engine Company, in which were incorporated propellers of a novel form, and most ingeniously adapted to this particular service, was placed in a light iron tug-boat, of a shape adapted to give it great buoyancy, and facility of cutting through the water, the whole weight of hull, engine, boiler, fuel, &c., not exceeding eleven tons; to the tug-boat was attached a train of six common canal boats, each containing a load of twenty tons, the train being connected by an extremely simple and beautiful coupling, for the purpose of keeping the boats in line; and the train was, on repeated trials, during several hours each, propelled at three miles per hour, by which each follows in the wake of that preceding it with perfect precision, only two men are required to each train—viz., an engineer and a steersman—who are stationed in the tug-boat. Thus this great problem, affecting the navigation of our inland waters, has been solved, and the successful result of these extensive canal interest, has been followed up by the adoption of steam power as permanent means of transit upon the Birmingham and Liverpool Canal. Consequently, the same principle has been applied to the Birmingham and Liverpool Canal. Consequently, the same principle has been applied to the Birmingham and Liverpool Canal.

## GOLD MINES IN SIBERIA.

**GOLD MINES IN SIBERIA.**  
In the *Mining Journal* of the 27th of May we published some interesting particulars of the discovery and method of working for gold in the sands of Siberia. The following additional particulars are extracted from a paper read before the French Academy of Sciences. "On the Progressive Increase of the Gold Production in the Operations on the Auriferous Sand of Siberia." This production of gold has been as follows:

| Years. | Pounds. | Years. | Pounds. | Years. | Pounds. |
|--------|---------|--------|---------|--------|---------|
| 1900   | 5       | 1904   | 20      | 1908   | 100     |
| 1901   | 10      | 1905   | 25      | 1909   | 150     |
| 1902   | 15      | 1906   | 30      | 1910   | 200     |
| 1903   | 21      | 1907   | 35      | 1911   | 250     |

In the year 1963 the produce was 631 pounds, and, assuming  
the result of 1963 will show a great increase on that of 1962. The work-  
force employed in the extraction of the gold are almost exclusively convicts,  
none employed in the extraction of the gold are Eastern Europeans. In 1963. They  
of whom there were not less than 1,000 in Eastern Europe. But they are  
are allowed the proceeds of one day in the week for themselves, but they are  
not permitted to dispose of the gold as they please; they are bound, on the  
contrary, to sell it to the persons who hold the privilege of its extraction.  
Consequently, gold has been sold at its value.

GEOLOGICAL RESEARCHES IN FRANCE.

At the Paris Academy of Sciences, last week, the report of the  
on M. Hubert's geological researches was read.—The iron ore noticed by M.  
Hubert is disseminated through the gritty effluvia of Meudon, where the mili-  
stone is worked. An analysis gave from 10 to 25 per cent. of metallic iron,  
and its quality is comparable with the granular iron which constitutes the  
richness of Nicotrosta sand Bory. The high price of wood and coal at Paris  
necessarily affords a hope that this discovery will be, for a long at least, ben-  
eficial to the industry of France; but it is regarded with great interest by ge-  
ologists, as affording proof that the iron ore of central France belongs to the  
tertiary, as affecting proof that the enormous period. Ferruginous minerals have  
multiple tertiary series, or so the numerous period. Ferruginous minerals have  
been already observed in the Paris basin, by M. de Roep, but their identity  
with those of Bory had not been sufficiently indicated. M. Hubert has after  
found, at Meudon, hydrated deposits of manganese, the analysis of which is

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|                           |         |
|---------------------------|---------|
| Head office of Netherland | 014     |
| City and office           | 010     |
| Population of town        | 000-000 |

In regard to the paleontology of the Paris basin, M. Hubert has discovered a new continuous bed, in the center of the massive *Succinea* of Netherland and France, containing numerous bones mixed with *Caprellina*; these bones are the smallest of the latter class, blackish and lamellate, and all, by an "undisputed" though not a numerous quantity of small fish, such as the tuberculate species of *Succinea* (genus *M. de Bonisville*), demand the tuberculate species found by M. Hubert, were *Caprellina*. Very recently, however, quantities of the phosphatic bed and crabs of lower, which characterize these subbasins.

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**EXHAUSTION OF WATER.**—An interesting and highly important study has been made by Professor Van Dine during his investigations of the very low water levels of the Hudson river. In the evening sessions of the Bureau of Fish and Game, on Friday, the 15th inst., a paper was read on the subject of "The Exhaustion of Water," by Professor Van Dine, who presented his findings of the exhaustion of water in the Hudson river.

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A New System—Mr. Shuman has discovered a new method of lighting, which he explains, without recourse of alcohol, liquid hydrocarbons, or other flammable substances, as follows:—The light is a powerful bright, and is used for general illumination, and is a very good one.

**DEFRIES' DRY GAS METER.**  
At the Society of Arts, on Wednesday, the 7th inst., the following paper was read by Mr. Defries, on his Patent Dry Gas Meter, some remarks on which will be found in another column:—

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|                                     |       |        |    |
|-------------------------------------|-------|--------|----|
| The Marine Anglers                  | ..... | \$1.00 | ea |
| Seaside United Service Club         | ..... | 1.00   | "  |
| Foreign Office                      | ..... | 1.00   | "  |
| Messrs. Shandlers and Cook          | ..... | 1.00   | "  |
| Mr. Smith, Long-ace                 | ..... | 1.00   | "  |
| Thomas Tassel                       | ..... | 1.00   | "  |
| Mr. Pearson, St. Paul's Church-yard | ..... | 1.00   | "  |
| Mr. Green, Strand                   | ..... | 1.00   | "  |
| St. James Institution               | ..... | 1.00   | "  |

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The lecture was illustrated by working diagrams showing entirely of glass (at least, by means of which, and a meter composed of made fully apparent deposited in the Adelaide Gallery), the compressor was operated with the principle upon which the gas was more brilliant, and the lecturer also showed, by experiment, that the gas passed through the meter that a longer flame was produced when the gas passed, also, was exhibited, then when it came direct from the same. A new glass, at the rate of three feet per hour, with a smaller burner, gave out a better light, at less cost per unit of work, than the large burner now in use, which consumes 70 per cent. more gas.

The lecturer gave great satisfaction, and was well attended, more than five hundred visitors being present, including many gentlemen well known in business circles.

**TWO TRINITEER SUBSTANCE.**—The thinnest substance ever observed in  
the film of the soap and water bubble, just before it bursts; yet it will reflect  
a faint image of a candle, or of the sun. Hence, its thickness must corre-  
spond with what Sir Isaac Newton calls "the beginning of blackness," which  
ended with what he terms Newton's oils "of the south part of an inch."

[illegible]

The CHAIRMAN, MAYNARD, asked the defendants to show cause why a writ should not be granted. He said that the defendants had applied for a writ, sitting upon a part of their own railway which they owned and controlled, a viaduct over a space of their own property through the grounds of a Mr. Baker, upon whose part the application was made. The answer crossed referred to the Act of Parliament whereby the railway company, and showed that, according to the provisions of the Act, the company had a right to use the land, and that the defendant, Baker, had no right to object to the use of the land, which was something which was not in dispute.

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As a result, the number of workers in the coal industry in the north and the south is 20,000, and will be increased to 20,000.

UNITED HILLS MINING COMPANY.

THELEIGH CONSOLIDATED MINING COMPANY.

each participant said he understood the great relief with which, from his own point of view, Mr. THOMAS said he had always viewed the great relief with which, from his own point of view, the worst of capital in mining affairs, and he believed if this had been done since similar age, and the directors had in, or the pressure of this time at their own expense, instead of having now to be so, he thought the same would have been in a better state, and the share higher in the market.—The following resolution was then unanimously agreed to, there being the representative present of good shares, and parties present, who had given consent

**UNITED MINES COMPANY.**

For twelve months, to the end of December, 1843.

| Date.   | Copper used. | Costs.   |            | Profit.    |          | Loss. |
|---------|--------------|----------|------------|------------|----------|-------|
|         |              | d. c. q. | d. c. d.   | d. c. d.   | d. c. d. |       |
| 1867    |              |          |            |            |          |       |
| Jan. 1  | 1000         | 0 0      | 1000 17 1  | 1000 10 0  | 0 0      | 0 0   |
| Feb. 1  | 1000         | 0 0      | 1000 17 1  | 1000 10 0  | 0 0      | 0 0   |
| Mar. 1  | 1000         | 0 0      | 1000 17 1  | 1000 10 0  | 0 0      | 0 0   |
| Apr. 1  | 1000         | 0 0      | 1000 17 1  | 1000 10 0  | 0 0      | 0 0   |
| May 1   | 1000         | 0 0      | 1000 17 1  | 1000 10 0  | 0 0      | 0 0   |
| June 1  | 1000         | 0 0      | 1000 17 1  | 1000 10 0  | 0 0      | 0 0   |
| July 1  | 1000         | 0 0      | 1000 17 1  | 1000 10 0  | 0 0      | 0 0   |
| Aug. 1  | 1000         | 0 0      | 1000 17 1  | 1000 10 0  | 0 0      | 0 0   |
| Sept. 1 | 1000         | 0 0      | 1000 17 1  | 1000 10 0  | 0 0      | 0 0   |
| Oct. 1  | 1000         | 0 0      | 1000 17 1  | 1000 10 0  | 0 0      | 0 0   |
| Nov. 1  | 1000         | 0 0      | 1000 17 1  | 1000 10 0  | 0 0      | 0 0   |
| Dec. 1  | 1000         | 0 0      | 1000 17 1  | 1000 10 0  | 0 0      | 0 0   |
| Total   | 10000        | 0 0      | 10000 17 1 | 10000 10 0 | 0 0      | 0 0   |

**BRITISH NORTH AMERICAN BANK.**

The SECRETARY then read the directors' report, which stated that, during the past year, several mercantile houses in Montreal and Quebec had failed, by which the bank had lost to some extent, but comparatively small, while it was feared that the losses referred to last year in New Brunswick would be larger than anticipated. The alteration made last year in the duties on the staple exports of that colony had caused much commercial depression, and it had been found hitherto impossible to realize many of the securities held by the bank, but sanguine hopes of an early revival of trade were entertained. After a careful and minute examination, the directors thought that \$1,000,000 would be required to cover all the losses of the bank. It stated that a resolution had been prepared for their approval, for altering the Deed of Ratification, so as to allow joint annuities as holders of shares. The total amount of undivided profit for the years 1841 and 1842 was \$6,000,000, 12s. 10d., from which must be deducted three dividends in December last, amounting to \$6,000,000, 12s. 10d., thus leaving the amount of undivided profits, to 31st December last, 18,000,000, 15s. 10d.; and, as a dividend at this time could only be founded on profits on the business of the bank since that time, the directors were of opinion they should best discharge their duty to the proprietors, from a proposition a dividend on that occasion. In answer to a question, from a proprietor, the SECRETARY said the total losses of the bank would be covered by \$6,000,000. The report was then adopted, and W. R. Chapman, J. J. Cumin, Esq., and Mr H. F. Green, were re-elected directors, when the meeting was made special, and the resolution for allowing joint annuities to shareholders was carried unanimously. Thanks were voted to the directors, the Chairman retired, and the meeting adjourned.

LONDON AND BRIGHTON RAILWAY.

Mr. James Drake, Mr. Catlett, and R. Sutton, jun., Esq., also were present, withdrew their names, and such alterations occurred in the property of giving all men to the election, or signifying; as the Chairman reading Mr. Stewart's motion, the clerical hands were declined again, and Mr. B. called

BRANDLING JUNCTION RAILWAY COMPANY.

meeting.

**AUSTRALIAN AGRICULTURAL COMPANY.**

**COMMUNICATIONS BETWEEN LONDON AND SCOTLAND.**—The subject of the most direct and economical junction railway to connect London with Glasgow and Edinburgh, now forms the subject of much speculation among railway projectors in the north; one line recommended is from Newcastle by way of Darlington and Carlisle. This latter is the line recommended by Mr. Fothergill, in his report to the Lords of the Treasury on the subject of railway communication between England and Scotland, and could be completed at a comparatively small cost, provided the gradients range from 1 in 100 to 1 in 80, a short distance each side the central level. The district of country which this line would open to the facilities of railway communication is very extensive, and, to a mineral point of view, equal to any of the same extent of surface in the Kingdom. While, at present, it has no means of transit but the old turnpike-roads, and those few. This line is ardently worthy the consideration of the capitalist, and particularly the railway companies in the north of England.

**Captain Norton's** **Landing Flashed Backward.** On a lake or pond where the lotus grows, Captain Norton had observed that when there was a strong breeze and waves ran up side, on the other, the water was comparatively smooth, resulting from the wind being so built as the broad surface of lotus leaves. He had also observed, after a storm at sea, the wild roar of broken waves. He had also observed, after a storm at sea, the calmness of a wooden vessel agitated by pieces by being driven against the shore, while a weaker basket emptied overboard. These two results suggested the idea of constructing a floating break-water of lotus, according to the distinctly Japanese model in the Polytechnic Institution, the object of which would be drifting compared with others.—*Polytechnic Journal*. [If an individual takes all his liberties in the air released to elsewhere as they do it—take up, this invention is far more advanced than anything else in which, of any kind, it has a substantial similarity, and of which we should be glad to receive some explanation; the same capacity to be increased the major's plan is here been submitted to the Polytechnic Institution, and to have been highly approved of them.]

There will be found in our present Number a letter from our intelligent correspondent, "W. W.," which will be, doubtless, read with interest, emanating, as such does, from a gentleman who, we are assured, is mostly an observer, and not one interested in unadorned operations, or hoarding of existing knowledge. The information he has acquired, however, affords ample evidence of his status of observation, and that his attention has been directed to this very interesting subject, on which we have long been anxious to acquire a further knowledge; and we, therefore, look forward with much interest to the continuation of his promised series of papers, convinced, as we feel, that we have yet much to improve in probability of doing which through the ordinary channels

**BEALE'S PATENT ROTARY ENGINE.**

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**THE DRY GAS-METER.**

In another column will be found an abstract of a paper read at the Society of Arts last week by Mr. Dublin, on the subject of that gentleman's dry gas-meter, to which we direct particular attention, as the merits of this meter are beginning to be known and appreciated, and we do not think we are saying too much in the observation, that every scientific man who has turned his attention to the subject, gives a decided preference to this over every other meter yet introduced; among them we may mention the names of Ure, Berzeli, Faraday, Palmer, &c. This meter besides having been proved to be most accurate in its measurement by experiment is naturally a test for the purity of the gas consumed. We have here shown several meters taken down after being in use for various periods, when different gases were used; one which had been in use five years, with gas from the Imperial Company, was as perfect as when first put up, and some others from the Chartered, Regent-street, Co., after periods of from six to three years, were in equally good condition, while two meters which had been in use for the same period, and supplied with gas from the joint works, as conducted by the Gasworks and Sulphur Works, were completely out, and the levers on which the diaphragms work, were completely broken, and the tin covered with green crystals. Public application is the best test, and it shows that a large portion of gas manufacturers and consumers appreciate this meter, the fact need not be stated, that in 1860 Mr. Dublin had only manufactured about 120, while the numbers on the which now daily leave the premises, are upwards of 2000.

Commodore in the fleet, retired Engineers by Capt. W. B. Thompson, A. S. F.

## ORIGINAL CORRESPONDENCE.

## MINING OPERATIONS IN SPAIN.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—From the repeated taunts and insinuations lately thrown out in the *Correspondence*, to some of which you reply in your *Journal* of the 19th inst., it would almost seem that the Editor of our paper doubted the existence of mineral wealth in Spain, and: as you were disposed to conclude that every notice taken of the progress of Spanish mining, in English newspapers, was intended for an insidious purpose—say, for nothing less than the formation of a "bubble company." Allow us to assure you that we have it in our power to state that mining in the vicinity of Cartagena is now conducted on an organized plan, of which in England there is little conception. The small space you can afford in your columns precludes the possibility of details; but briefly permit us to assure you that, in the above quarter, mining began with associations and so successful have their efforts proved, that the number of them now exceeds 300, and in order that the works should be carried on with system and regularity, a central junta of miners was there recently formed, composed of practical men, assisted by responsible officers. This junta conducts the mining operations in the neighbourhood, corresponds with the Government, keeps books for the register and transfer of shares, and weekly publishes a journal of the mining transactions in their district. Therefore, we, as correspondents and agents to the Cartagena central junta, are ready to afford any further information on the subject; at the same time, a correspondence has been opened, as you will see from the following official returns of ores obtained in the mines of each—viz.: Carmen, 1,500,000 arrobas (25 lbs. each) in four years; Osmarodon, 1,100,000 ditto in three years; Rapunza, 787,000 ditto in two years; Estrella, 80,000 arrobas in one year;—the lowest price of which was 15 reales per arroba, at the pit's mouth.

35, Dratched, June 15.

F. P. PERE, AND C.

## TRANSLATION OF THE ORIGINAL.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—The ore-bearing district having been abolished, expediency suggests the necessity of establishing another one. More suitable spots, a better prospect the other is better, obtained from the rich mines of Sierra Almagro and other points upon this coast, from passing over to the other coast, by which means a neighbouring nation enjoys a large share of the produce of its own industry, which might be reduced to the advantage of Spain. The necessity of such an enterprise is more apparent as our mineral wealth develops itself. There are already established upon our coast, from Alfo to Valencia, as many as 120 mining works, which, in the course of last March, yielded 170,000 ounces of silver to foreign exportation. To the above number of establishments Cartagena has 100,000, which, in the course of last April, afforded a result of 14,000 ounces of silver. All this rich produce of our mines, with the deepest regret, we are compelled to send, from year to year, to foreign lands, in beautiful bars, to the west of a mere paper on which. (Our city is, therefore, the most eligible spot—the distance from Alfo to Valencia being only 100 miles, in which space, as before noted, there are the establishments for the treatment of ores, and in the centre of the New World (Cartagena). On the other hand, the security offered by a fortified city, the proximity of our port, comparatively the best in the Mediterranean, and the proximity to the Sierra Almagro—both great, and almost insurmountable, sources of mineral wealth—these favourable circumstances have led to the establishment of a mine. We, therefore, propose, Sir, (I now follow the signatures of the members of the junta—viz.: Carmen, May 15, 1861.)

[We are obliged to our correspondents for their communication, and shall gladly avail ourselves of any further information it may be in their power to afford. We have also to acknowledge receipt of the publication *La Minería*, Cartagena, 27th ult.]

## MINING IN SPAIN.—N. 1.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—For years your *Journal* has been an essential record of mining transactions carried on in every quarter of the globe and also the way vehicle of such information as was calculated to guide the operations of miners, whether working at home or abroad—without however forgetting that the first duty of a journalist is to consult the interests of his native land. This character I have seen supported in your paper, from the commencement, having been among its earliest readers; but, whilst I followed you from South America to Sicily, and noticed all interesting accounts which you occasionally gave us of the progress of mining in distant countries, although never losing sight of what was going on under our own soil, I have often thought that—when so great a change has taken place in this branch of industry in Spain—when the descendants of the discoverers of the New World are exploring those sources of mineral wealth which their forefathers discarded in order to go and dig for gold and silver in Mexico and Peru—this new and curious subject was rather neglected in your columns; and, at least, not systematically treated. Such being my impression, and having some leisure time on my hands, I have been induced to condense my materials on Spanish mining, and put in regular order something like form and shape, with the view of offering them to you in a series of four letters, in which I propose a rest of the evidence which the Spanish possessors of the existence of mineral wealth, among them, their legislation as regards mining, and the progress which they have made within the last two years in digging for and smelting ores; as far as we are enabled to ascertain of this opportunity to acknowledge that I am no miner, and have no interest whatever in underground operations. To me this is a subject of mere curiosity; but I am not unaware that several of our countrymen, as well as Frenchmen, are already concerned in this class of operations in Spain; and so large a trade in coal has been set up on the Mediterranean shore of that country, almost exclusively supplied by us, that our naval officers were lately engaged a cargo, some Cartagena, or the safety of British sailors.

Without further explanation of my motive, I shall proceed to state that, as soon as the civil war ended, it became the decided policy of the present Spanish Government to encourage the development of the various resources with which their domain of the Peninsula is endowed—where agriculture, the construction of roads, and mining, claimed and obtained special patronage and encouragement. A step for which, in fact, followed which was considerably increased by the discovery of old mines under ground, in the vicinity of Cartagena—attributed by some to the Romans, and by others to the Carthaginians. A strong desire was at the same time manifested by the public to have what authentic documents the Government possessed on early mining transactions in the country, when the nobles of Hispania and other plants were recruited, and chronicled under the name of *Mineros* commonly granted to individuals for that purpose, specifying names, places, and dates. The general contents of such abstracts are now before me, and from them I gather that some of these licenses bear a date anterior to 1325. The fact is, that, although the Spaniards had no literary historical testimonies of the quantity of precious metals extracted from their country by the ancients, they were so much engaged in civil wars, that, till after the complete expulsion of the Moors, in the fall of Granada (1492), they had no time to attend to other occupations or collecting. The ministers of Charles V. gave a new attention to national industry, and during his reign the earliest mining license, of which account we have, appears to have been granted. Of these, from 1520 to the middle of the last century, the mines are—Gold, silver and partly mixed with silver, 145; iron, pure, and mixed with other metals, 159; copper, pure, and mixed, 74; iron, 61; lead, pure, and mixed, 33; quartz, 18; sulphur, 30; and zinc, 17; the, &c., with a few others, under the title of sulphur, saltpetre, oil, and coal.

According to our laws, the properties of land is entitled to everything beneath its surface, gold and silver excepted, which belong to the Crown. In Spain the rule is different; there, all mines are included within the royal prerogative, so that the ground on which they are discovered—and, accordingly, we can see work them without a special license. As, however, it is the interest of the government to encourage progress leading to the populating of the country, and because the revenues, every facility is afforded to persons wishing permission to work any mines situated; and the property thereby acquired becomes personal, transmissible, and inheritable. The principal conditions imposed upon the grantee are: that he shall make good to the proprietor of the land any injury, in case of failure, caused by digging and working for ore; and that he shall pay to the Government a set price, on the produce of all ores mined, less expenses. As exemplars of the Crown, are reserved—the qualifications of the mine of Almaden, the copper mines of Rio Tinto, the lead mines of

Mercurio and Potosi, the extensive mines of Almaden, and the sulphur mines of Huelva and Bonassard. With these exceptions, and a few salt mines, all others, already known or hereafter discovered, are left open for the competition of individuals. No license is, however, required for collecting sulphur and in the waters, nor are any dues exacted upon the produce, provided this is not obtained by means of works purposely established. Miners duly licensed are allowed the use of all waters in the vicinity of their works, and also to cut in the neighbouring forests such timber as they may require, on the proprietors being indemnified.

These facilities, and the known existence of mineral wealth in the country, have always kept alive a mining spirit among the Spaniards, which political convulsions prevented from assuming a more active development. As early as July, 1849, confidence had, however, been so far restored, that several new mining licenses were solicited and obtained, more particularly for the southern provinces—regions, in their appearance, perfectly distinct from those situated in the opposite direction; for, while the former are distinguished by metalliferous veins and deposits of the chert ore, the others abound in iron and other less valuable ores. The one division seems, in fact, to belong more to Africa than Europe, and is also remarkable not only for a difference in the soil, climate, and vegetation, but also in the physiognomy and manners of the natives. By modern Spanish geographers, the southern provinces, or those bordering on and near the Mediterranean, have been called the Iberian division, which is traversed by ranges of lofty mountains, marked by a peculiar character; of these the principal one is the Sierra Morena, abounding in minerals. Of this division, perhaps, the most interesting section is Murcia, of which Cartagena (Cartago Nova) may be considered as the head—being, besides, a superb city and good port, a royal arsenal and dock-yard. Here the Carthaginians were long established, and in the neighbourhood carried on extensive mining works, an example followed up by the Romans, the vestiges of whose underground labours are now occasionally discovered, and fill the mind with amazement. The progress of mining in this district will form the subject of my next letter.

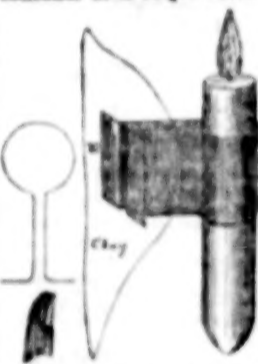
London, June 12.

[We are obliged to our correspondent for his communication, as forming the first of a series of papers on the mines of Spain, for we are well satisfied, it is not by stilted inquiry that we shall prevent the working of them. A full and fair knowledge of the subject will benefit the English miner, as well as the English capitalist, and we shall, therefore, gladly avail ourselves of any information on the subject which may be presented to our notice.]

## MARTIN'S MINERS' CANDLESTICK.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—The man who, like yourself, has an ambition to be useful, will attend to the small as well as the great, from a point which has no dimensions to the immensity of space. The lighting of a mine, however, when we consider its utility, and the vast sums paid for candles, &c., is, perhaps, any thing but a trivial matter; and I shall, therefore, after describing the Cornish mode of so doing, proceed to describe a little contrivance, which may save expense and trouble. Cornish mines are invariably lighted with tallow candles, of about eight or twelve to the pound, with a square wick. The tallow is generally of an inferior kind, and the wick very coarse, probably, to prevent their being blown out by currents of air, which are few and far between. On a miner's descending the shaft, he generally puts a short piece into a bit of clay, which he places on the front of his "hel" cap. When he arrives at his "pitch," he faces the clay, containing the candle, to the side, or end, of the shaft, level, &c., as may be most convenient. As the candle burns down, he occasionally lowers the clay, by working it (the clay) down around the candle with his fingers and thumbs. As the candle is seldom perfectly clean, the clay gathers round the wick, and the miner is, therefore, as well as in consequence of "bad air," obliged to work in, what Milton would call, a "darkness visible." Sometimes he is obliged almost to invert his candle to make it burn, when the air is very impure, and more gas is thus given off than otherwise would be. To prevent the soiling of the candle, and the trouble of working down the clay, I have invented a "miner's candlestick," which I have tried, and which will, it is hoped, be found to answer the purpose admirably. It is made of one piece of steel spring plate, opened to admit the candle, when first put in, by the insertion of the thumb; the clay is then attached to the ends E, and will sustain the candle and candlestick in any position; and the candle, when nearly burned down, may be pushed up through the socket, so as to burn the last bit. I may be told that miners are a reckless set, and will not adopt any new plans, but there are rules in some mines, backed by pains and penalties, as stringent as an Act of Parliament, and are so deemed by the magistrates on common law wages.



and penalties, as stringent as an Act of Parliament, and are so deemed by the magistrates on common law wages.

Penzance, May 13.

## ON THE COMBUSTION OF COAL.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I venture to offer a partial reply to the questions relating to the combustion of coal, lately proposed in your *Journal* by Mr. T. Smith, of Birmingham. With regard to the first question—"How many cubic feet of atmospheric air pass through the instrument fuel on the grate of a furnace on the old construction, and how many cubic feet ought to pass during the combustion of a ton of bituminous coal?" It must be evident to any person acquainted with the various constructions of boilers, and the differing relative proportions of fire-grates, flues, and chimneys, adapted by different manufacturers, that a definite answer cannot be given to the former part of this question; but the latter part is rather more tangible. It appears to be proposed, under the impression that the air which passes through the fuel is employed in effecting complete combustion only, when that answer is properly attended to. But this, I conceive, is an erroneous impression; for, let us suppose the case of a furnace, when the operation by it is advanced that the fuel has become incandescent, and the average heat of the furnace attained, how then, and to what extent, is the process of combustion carried on? In the first place, the air is entering by the two ends, with at least its average velocity, and, on coming in contact with that soil which it first encounters, it takes up its equivalent of one atom of carbon for every two atoms of oxygen—then immediately forming the last giving product, carbonic acid gas. Then, if it could be supposed that one third of the fuel only was present, and that this was sufficient to keep up the heat of the furnace (which it would not be), as far as the solid carbon is concerned, complete combustion might be said to have taken place. For the sake of argument, however, let this be granted, and let a fresh charge of fuel be then supplied (if it is sufficiently supplied, the following effect will be continuous, instead of intermittent), then the hydro-carbon gases which are evolved from the fresh fuel pass away with the carbonic acid, hypothetically formed from the incandescent fuel on the hearth, the carbon and hydrogen (constituents of the hydro-carbon gases) withdrawing from the carbonic acid a portion of its oxygen. The result would be, the formation of a stable volume of carbonic acid gas (as invisible, and yet a combustible gas), and a certain portion of steam, having abstracted another portion of the carbonic acid, which, together with the steam, would be the only products of complete combustion. Supposing, at the same time, a thermometer observing the top of the chimney of a furnace as suggested, and without any appearance of smoke, his external impression would be, that "the smoke was consumed, and that complete combustion had been effected." But the chemist would tell him that this is not the case, and that such is an error, for the carbonic acid gas is invisible, and not combustible, and that, if consumed away, it might still be made available for the purpose of combustion (as it now does, I believe, in the common case), and, consequently, that complete combustion had not been effected. But, to view hypothetically, and then to the actual facts of the case; it may be safely stated that, in practice, no furnace is, or could be, worked with a single layer of incandescent fuel on the hearth; and what then are the effects produced by the abstraction of air through the fire-bars? The air, as it first enters, forms carbonic acid gas, and goes on and the due proportion of heat. By passing up through the flues, however (as Mr. C. W. Williams describes it, in chemical authority, at page 51 of his work), it takes up another atom of carbon, and forms carbonic acid, which is a combustible gas, and a heat-absorbing rather than a heat-giving product.

This gas, however, as before stated, might (if duly provided with atmospheric air) have been made available. But, further, what becomes of the hydro-carbon gases, when a fresh charge is introduced? These gases must either pass away without the saturation due to their complete combustion, or abstract from the carbonic acid, formed from the incandescent fuel, a portion of its oxygen. In either case, much carbon must pass away uncombined, and at a low temperature, in the form of the well-known substance called "smoke."

With regard to the second question, it appears to me, that, after what has been already said, it will be sufficiently included in the answer to the last question. I propose to answer this question "approximately, and on an average," which is the only way in which a general answer can be given to it. For this purpose, an average of proportions may be taken from (table 1) page 18 of Mr. C. W. Williams's work, *On the Combustion of Coal*, whence the following analysis is obtained. Of 100 parts, carbon has 80, hydrogen 6, oxygen 10, and ashes 4.—Total, 100.—[These proportions, though not strictly correct, even as an average, yet, seeing that the experiments on different sorts of coal vary, will, probably, be sufficiently near the truth for the present purpose.] Now, according to the laws of chemistry, the saturating equivalent for one atom of carbon is two atoms of oxygen; or, by weight, sixteen parts of oxygen for six parts of carbon—consequently, 80 = 16/6 = 266.66 parts of oxygen required for the eighty parts of carbon. But, further, the saturating equivalent for one part of hydrogen is eight parts of oxygen—consequently, the six parts of hydrogen in the above analysis will require for saturation 6 × 8 parts of oxygen. Hence the total weight of oxygen required for the complete saturation of 100 parts of this coal, is 80 × 16/6 + 213.33 = 261.33 parts.

But, ten of these parts are supplied from the coal in the above analysis naturally, therefore there remains to be supplied mechanically 251.33 parts of oxygen. But, it is stated, in the opinion of Professor Daniell, as given at page 100 of Mr. C. W. Williams's work, that, "for the complete combustion of olefiant gas, it is necessary to mix the gas with five times its volume of oxygen, though three only are consumed;" "even subcarburetted hydrogen it is necessary to mix with more than twice its bulk of oxygen." Hence it appears that an additional quantity of oxygen should be supplied beyond what is actually consumed; and, since olefiant gas exists in coal gas, only in a small proportion, compared with the subcarburetted hydrogen, it may be sufficient to increase the quantity of oxygen by one-fourth part—then we have 251.33 × 1.25 = 314 parts of oxygen necessary for the complete combustion of 100 parts of coal; whereas, for 1 lb. of coal, there should be about 3.14 lbs. of oxygen supplied. But the proportion of oxygen in atmospheric air is, by weight, as 8 : 36; therefore, 3.14 × 9/8 = 3.57 lbs. of atmospheric air required to be supplied for the complete combustion of 1 lb. of coal. Now, to find the number of cubic feet that shall weigh 3.57 lbs. The specific gravity of air is 1.2, water being 1000, and since a cubic foot of water, whose specific gravity is 1000, weighs 62.4 lbs., we have, as 1000 : 1.2 :: 62.4 : 0.75 = 2533 lbs. of one cubic foot of air; and as 0.75 : 1 :: 14.13 : 108.4 = cubic feet of air, whose weight is 14.13 lbs. Thus, we have the number of cubic feet of air that should be supplied to effect the complete combustion of 1 lb. of coal. Now, in order to ascertain the cubic feet of aerial products of the complete combustion of 1 lb. of coal, we have 3/8 of carbon, which, with its saturating equivalent of oxygen, makes 3/8 × 16/6 = 4/3 = 1.333 lbs. of carbonic acid gas from 1 lb. of coal. And the specific gravity of carbonic acid gas being 1.52, when air is unity, we have 1.32 × 0.75 = 1.14 lbs. weight of a cubic foot of carbonic acid gas—therefore, 1.32 × 25.7 = 33.924 cubic feet of carbonic acid gas from 1 lb. of coal. But, further, the specific gravity of saturated hydrogen, or steam, is 0.525, air being unity—hence 0.525 × 0.75 = 0.394 lbs. weight of a cubic foot of steam. Now, the 3/8 parts of hydrogen in the 1 lb. of coal, with its saturating equivalent of oxygen, is 3/8 × 8 = 3/4 = 0.75 lbs. weight of steam, or saturated hydrogen; therefore, 0.75 × 11.5 = 8.625 cubic feet of saturated hydrogen from 1 lb. of coal of this quality. In conclusion, the air, with 3/8 of its oxygen extracted, leaves 1/8 of its bulk of nitrogen, and 1/8 of its bulk of oxygen; hence we have—

Cubic feet of nitrogen ..... = 3/8 × 188.4 = 150.75  
" sulphur oxygen ..... = 3/8 × 188.4 = 7.93  
" carbonic acid gas ..... = 33.924  
" steam ..... = 11.5 — 195.45

Thus, with the extra allowance of one-fourth part, to insure complete mixture, we have, for 1 lb. of coal, to supply a number of cubic feet of air = 188.4, and the result is a number of cubic feet of aerial products = 195.45—supposing complete combustion to have been effected; and, therefore, for the complete combustion of a ton of bituminous coal, we have—

Cubic feet of air ..... = 188.4 × 2240 = 422016

" aerial products ..... = 195.45 × 2240 = 437808

These remarks, Sir, I trust, will tend, in some measure, to satisfy Mr. T. Smith's inquiry, as, I doubt not, it will be given that a general definite answer cannot be given.

Liverpool, June 6.

T. GARNETT, Engineer.

## UPTON AND ROBERTS'S SAFETY-LAMP.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—As Upton and Roberts's safety-lamp contains an envelope of wire gauze, and may ignorantly be confounded with that of Davy, I venture to describe its structure, and state the principles of its safety. The wire connected with the oil stream is considerably larger than that of the Davy; it is surrounded by a wire gauze cylinder, which, by the addition of an external cylindrical glass, is made entirely air tight. The air which supplies the wick flame enters through a circular series of orifices below the wick, passing in its transit two series of wire gauze, and further noted out to the wick flame by a circular opening (in a conical piece of brass), of which the wick flame forms the focal centre. Under these adjustments, the principle of safety consists in this—No more air is admitted into the lamp than can be consumed by the wick flame—consequently, the lamp can never fill with flame, and in the interior alone prevails an atmosphere of a negative character, with regard to combustion, and is no part of it will be an ignited taper burn for an instant. Its safety is absolute, and currents of air and "blowers," alike inert, cannot affect it. It is true, should the glass be shattered by accident, the lamp is immediately reduced to the condition of a "Davy," but a Davy in its best state; for, as long as the glass maintains its integrity, the true wire gauze is preserved from rust.

June 14.

J. MURRAY.

## ANDREWS'S CORN SAFETY BELT.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—In your valuable *Journal* of the 1st of April last, Mr. J. Murray, a his letter on the 15th inst., speaks favourably of a "corn safety belt," made by "Andrews, of Manchester," as being both efficient and portable. Could Mr. Murray furnish us with the address of Mr. Andrews? as, upon referring to the *Manchester Directory*, I find there are about twenty-five persons of that name, consequently am at a loss where to communicate with.

St. Helen's, Lancashire, June 15.

A. NEWBERRY.

## MR. HENWOOD'S WORK ON METALLIFEROUS DEPOSITS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—In your *Journal* of the 20th of April last public attention was directed to the probability of an early issue of Mr. Henwood's elaborate work—comprising which the latest anticipations have, for a length of time, been estimated, as the result of fourteen years' research, on a subject of the greatest importance, by a gentleman universally qualified for the task. I have made frequent inquiries of bookellers, both here and in Cornwall, and have not been able to procure one, though I have been cordially informed that a copy has been received in London at least a fortnight since. I should feel particularly obliged by your referring me of the best means of making application, or of a satisfactory means of our being supplied. I am the more anxious for an immediate reply, as I understood the talented author to stand (rating the country as a professional) near to the Stratford Mines, and I am apprehensive of great delay in procuring a copy.

London, June 14.

[We had the pleasure of personally communicating with Mr. Henwood on his late visit to town, when, we believe, arrangements were definitively made with reference to his departure to Glasgow, which may be expected to take place within a month. We have not received our copy of the work, although promised as early proof, but doubt not that its publication will act as a further encouragement, more especially as the author may be said to be on the eve of departure.]

## CIRCUMFERENCE—PUTTY.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—It is a point upon which some difference of opinion exists, as to whether "putty" (as commonly used by glassmen) undergoes any chemical change when it is mixed with glass and heat. It is of importance to parties who use circumferential putty to be satisfied upon this point; and as I find, in your *Journal*, it is a common practice amongst parties to fix the dial glass in with it, I have been induced to research upon, Mr. Editor, as to whether it is the best article which could be used for the purpose.

Cardiff, June 5.

and says that while going through mail, and read in December, 1902, a letter

